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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/695,739 | 10/30/2003 | Yueh-Chuan Lee | 0941-0860P | 6178 |

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EXAMINER

LE, DUNG ANH

ART UNIT PAPER NUMBER

2818

DATE MAILED: 01/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|-----------------|--------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/695,739 | LEE ET AL. | |
| | Examiner | Art Unit | |
| | DUNG A LE | 2818 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) 1-15 and 24-34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 16-19, 21-38 and 40-42 is/are rejected.
- 7) ☒ Claim(s) 20 and 39 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

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DETAILED ACTION

Oath/Declaration

The oath/declaration filed on 9/11/2003 is acceptable.

Election/Restriction

Applicant's election **with traverse** of claims **16-23 and 35-42** is acknowledged.

Because Applicant did not distinctly and specifically point out the supposed error in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). Applicants have the right to file a divisional, continuation or continuation-in-part application covering the subject matter of the non-elected claims.

The traversal is on the ground(s) that see the election paper. This is not found persuasive because the fields of search for method' and device claims are NOT coextensive and the determinations of patentability of method and device claims are different, that is process limitations and device limitations are given weight differently in determining the patentability of the claimed inventions. Also, the strategies for doing text searching of the device claims and method claims are different. Thus, separate searches are required.

The requirement is still deemed proper and is therefore made **FINAL**.

Specification

The specification is objected to for the following reason:

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed (see MPEP § 606.01).

Note that, the claims are directed to semiconductor device instead of to a method of making a semiconductor device.

The specification has been checked to the extent necessary to determine the presence of all possible minor errors. However, the applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections

Set of claims 16- 23

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 16-19 and 22 are rejected under 35 USC 102 (b) as being anticipated by Graettinger et al. (6348709).

Graettinger et al. teaches a semiconductor structure with a partially etched gate, comprising:

a semiconductor substrate 1610; a gate dielectric layer 1621, a gate conductive layer 1622 and a cap layer 1640, sequentially stacked on the substrate to form a gate structure; (figs. 18A – 19B) and a lining layer 1700 disposed on sidewalls of the gate structure, wherein the lining layer 1700 disposed on one sidewall of the gate structure is partially etched to expose the adjacent gate structure 1800.

Regarding claim 17, an inter-layer dielectric layer covering the gate structure; and a bitline contact 2600 formed in the inter-layer dielectric layer 1750, exposing the substrate 1610 and a portion of the gate structure therein, wherein the lining layer 1700 of the exposed portion of the gate structure is partially removed.

Regarding claim 18, wherein the exposed gate structure is the gate conductive layer 1622/1624.

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Regarding claim 19, wherein the gate conductive layer comprises a polysilicon layer 1624 and a metal silicide layer 1624.

Regarding claim 22, wherein the lining layer is a rapid thermal oxide (RTO) layer. (col 8, line 44).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 21 and 23 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Graettinger et al. in view of the following remark.

Graettinger et al. disclosed the claimed invention as applied to claim 16, and a spacer 2400 disposed on sidewalls of each gate structure (fig, 19A), except for a spacer covering the lining layer and material of the spacer is silicon nitride.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the spacer to cover the liner and material of the spacer is silicon nitride, because it is commonly used to prevent undesirable reactions in the

contact region, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use.

Set of claims 35- 42.

Claims 35- 38 and 41 are rejected under 35 USC 102 (b) as being anticipated by Graettinger et al. (6348709).

Graettinger et al. disclose a semiconductor structure with a partially etched gate, comprising:

a semiconductor substrate 1610; a gate dielectric layer 1621, a gate conductive layer 1622/1624 and a cap layer 1640, sequentially stacked on the substrate to form a gate structure; and

a lining layer 1700 disposed on sidewalls of the gate structure, wherein the lining layer disposed on two sidewalls of the gate structure is partially etched to expose the adjacent gate structure. (figs. 18A).

Regarding claim 36, an inter-layer dielectric layer 1750 covering the gate structure; and a contact formed in the inter-layer dielectric layer, exposing the substrate and a portion of the gate structure therein, wherein the lining layer of the exposed portion of the gate structure is partially removed.

Regarding claim 37, the exposed gate structure 1800 is the gate conductive layer 1622/1624 (fig. 18A).

Regarding claim 38, wherein the gate conductive layer comprises a polysilicon layer 1622 and a silicide layer 1624.

Regarding claim 41, wherein the lining layer is a rapid thermal oxide (RTO) layer. (col 8. line 44).

Claims 40 and 42 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Graettinger et al. in view of the following remark.

Graettinger et al. disclosed the claimed invention as applied to claim 16, and a spacer 2400 disposed on sidewalls of each gate structure (fig. 19A), except for a spacer covering the lining layer and material of the spacer is silicon nitride.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the spacer to cover the liner and material of the spacer is silicon nitride, because it is commonly used to prevent undesirable reactions in the contact region, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use.

Reasons for Indication of Allowable Subject Matter

Claims 20 and 39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, since the prior made of record and considered pertinent to the applicant's disclosure does not teach or suggest the claimed limitations. Graettinger et al. (6348709) and Background of Invention , taken individually or in combination, do not teach the claimed invention having **(Regarding claims 20 and 39)** wherein the exposed gate structure is the metal silicide layer and portions thereof are partially etched.

If Applicants are aware of better art than that which has been cited, they are required to call such to attention of the examiner.

When responding to the office action, Applicants' are advice to provide the examiner with the line numbers and page numbers in the application and/or references cited to assist the examiner to locate the appropriate paragraphs.


A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) day from the day of this letter. Failure to respond within the period for response will cause the application to become abandoned (see M.P.E.P 710.02(b)).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dung A. Le whose telephone number is (571) 272-1784. The examiner can normally be reached on Monday-Tuesday and Thursday 6:00am- 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DUNG A. LE 
Primary Examiner
Art Unit 2818